

REMARKS

Claims 1-38 remain pending in the application. Reconsideration is respectfully requested in light of the following remarks.

Section 102(b) Rejection:

The Examiner rejected claims 18-23 and 25-28 under 35 U.S.C. § 102(b) as being anticipated by Christensen, et al. (U.S. Patent 4,271,468) (hereinafter “Christensen”). While Applicant maintains that the distinctions previously asserted in regard to original claim 18 are still valid, to expedite prosecution, Applicant has amended claim 18 to indicate that each bit of the lowest level of the hierarchical channel map is dedicated only for a corresponding communication channel to which it is mapped. Since this amendment matches the amendment previously made to claim 1, no new issues are raised. In Christensen, each location of queues Q0-Q7 may store an interrupt request for any interrupt channel. Clearly, each queue entry in Christensen is not dedicated only for a corresponding communication channel to which it is mapped. Thus, claims 18-23 and 25-28 are not anticipated by Christensen.

Section 103(a) Rejection:

The Examiner rejected claims 12-17, 24 and 29-38 under 35 U.S.C. § 103(a) as being unpatentable over Christensen. Applicants respectfully traverses this rejection for at least the following reasons.

In regard to independent claim 12, Christensen does not teach selecting a set bit in a top level of a hierarchical channel map, wherein the set bit in the top level indicates a group of bits in a next level of the hierarchical channel map to examine. In Christensen, a channel controller 24 sends an SIGI command to system controller 22, “and the decoded command sets a corresponding bit in PND register 46 to identify the queue on which an entry is to be added” (Christensen -- col. 6, lines 31-34). Thus, the

SIGI command from the channel controller 24 only identifies the queue on which an entry is to be added, not a group of bits in a next level of the hierarchical channel map to examine. Christensen simply teaches adding an entry to the queue, not examining a group of bits in a next level of the hierarchical channel map. Christensen also teaches that a central processor 20, 21 selects from among active states of PND register 46 as broadcast by system controller 22 in order to accept a queue to handle. However, the PND register position selected by the central processor only indicates a particular queue that the processor has accepted for handling. If the processor is selected by system controller 22, the processor then removes the oldest active entry on the accepted queue (col. 7, lines 20-24). Again, the selection of a PND register position by a processor in Christensen clearly does not indicate a group of bits in a next level of a hierarchical channel map to examine. To meet the language of claim 12, the Examiner's position must be that a set bit in Christensen's PND register indicates a group of bits in a next level of the hierarchical channel map to examine. However, nothing in Christensen examines bits in one of queues Q0-Q7 as a next level of a hierarchical channel map. Christensen only teaches that a set bit of the PND register indicates a queue for which an entry is either added or removed. However, adding or removing an entry from a queue has nothing to do with examining a group of bits in a next level of a hierarchical channel map.

Further in regard to claim 12, Christensen does not teach examining in each of one or more intermediate levels of the hierarchical channel map only a group of bits indicated by the set bit selected in the previous level and selecting a set bit from each examined group, wherein the top level is the previous level for a first intermediate level. The Examiner cites *St. Regis Paper Co. v. Bemis Co., Inc.* for the premise that it is generally considered to be within the ordinary skill of the art to duplicate parts for a multiplied effect. However, duplicating queues Q0-Q7 in Christensen would simply provide more queues at the same level as queues Q0-Q7. Duplicating queues Q0-Q7 in Christensen would not create intermediate levels of the hierarchical channel map nor an organization of channel sections. Furthermore, the one or more intermediate levels recited in claims 12, 29 and 30 are not "duplicate parts for a

multiplied effect” of either the top level or lowest level of the hierarchical channel map. The one or more intermediate levels are recited as having functionality distinct from either the top-level or lowest level. Therefore, the Examiner’s reliance on *St. Regis Paper Co. v. Bemis Co., Inc.* is clearly misplaced.

Applicant also respectfully disagrees with the Examiner’s assertion that “the stages of Christensen provide for an organized system, and accordingly, at the time of the invention it would have been obvious to one of ordinary skill in the art to include additional organizational stages within the hierarchy of Christensen in order to provide additional organization for a multiplied effect.” Christensen teaches eight queues, each of which may contain a number of active entries representing pending interrupt requests (col. 6, lines 3 – 14). Christensen further teaches that a pending register has eight bit positions which correspond to the eight queues. The set state of a pending register bit indicates that its queue is non-empty, while a reset state indicates its corresponding bit is empty (Col. 6, lines 24 – 50). To the extent that the PND register or queues in Christensen could be considered “organizational stages”, any duplication of this parts would only have an effect at the same level (i.e., as an additional PND register bits or as additional queues). Accordingly, it would not have been obvious to have introduced intermediate stages between Christensen’s queues and pending register.

In response to these arguments, the Examiner states in his Response to Arguments section that “it would have been obvious to one of ordinary skill in the art to utilize the organization of the stages for a multiplied effect, and not to provide additional queues QO-Q7 in the same lowest level or a copy of one of the same levels as applicant has contested.” However, when one considers only the prior art, the Examiner’s statement clearly amounts to hindsight reasoning. The organization of a PND register having eight bits that each correspond to one of eight queues for holding pending interrupts does not in any way suggest “examining in each of one or more intermediate levels of the hierarchical channel map only a group of bits indicated by the set bit selected in the previous level and selecting a set bit from each examined group, wherein the top level is the previous level for a first intermediate level” as recited in claim 12. Christensen’s

PND register and queues do not provide any suggestion of an intermediate level of a hierarchical channel map in which only a group of bits indicated by the set bit selected in the previous level are examined and from which a set bit is selected.

The Examiner also refers to the brief mention at the end of Christensen's disclosure that the concepts could be extended to a system having more than two central processors and more than one system controller. At most this would suggest having additional PND registers (one for each system controller). The presence of more central processors and system controllers in Christensen's system would not suggest an intermediate level of a hierarchical channel map in which only a group of bits indicated by the set bit selected in the previous level are examined and from which a set bit is selected. The Examiner speculates that an embodiment of Christensen's system having multiple system controllers (each having a PND register) would suggest an additional register having bit positions each corresponding to one of the system controllers. This is pure hindsight conjecture by the Examiner. Having multiple systems controllers does not suggest any such additional register level. At most, it would simply suggest having another PND register.

Further in regard to claim 12, Christensen does not teach examining in a lowest level of the hierarchical channel map only a group of bits indicated by the previous intermediate level and selecting a set bit from the examined group of the lowest level, wherein the selected bit at the lowest level indicates one of the plurality of communication channels to be serviced, and servicing a communication request from the communication channel indicated by the selected bit from the lowest level of the hierarchical channel map. As discussed above, Christensen only teaches that a set bit of the PND register indicates a queue for which an entry is either added or removed. To meet the language of claim 12, the Examiner must be asserting that something in Christensen examines a group of bits of one of the queues Q0-Q7 as indicated by the PND register and selects a set bit from the examined group of bits of the queues wherein the selected bit indicates one of a plurality of communication channels to be serviced. However, Christensen only teaches adding and removing entries from

queues Q0-Q7. Adding or removing an entry from a queue does not teach examining a group of bits in a lowest level of a hierarchical channel map and selecting a set bit from the examined group of bits wherein the selected bit indicates one of a plurality of communication channels to be serviced.

In regard to claim 29, Christensen does not teach a top level service mask, a second level service mask and a bottom level service mask and the corresponding operations as recited in claim 29. On pp. 7-8 of the Final Action, the Examiner only refers to Christensen's I/O mask 51 and col. 6, lines 51-67. Applicant does not see any relevance to Christensen's I/O mask 51 to the top level, second level and bottom level service masks recited in claim 29. Christensen's I/O mask 51 is described only as preventing one of the processors from accepting a particular queue for handling after the particular queue has already been accepted by another processor. Furthermore, Christensen's I/O mask 51 does not indicate a position in a level group of a hierarchical channel map. Nor is it set to indicate a selected first set bit in the current level group.

Moreover, claim 29 recites three different service masks. **The single I/O mask in Christensen clearly does not teach three different service masks as recited in claim 29.**

Furthermore, claim 29 recites that each service mask is set to indicate the position of the selected bit in the accessed corresponding level group. **The single I/O mask in Christensen has nothing to do with indicating a position of a selected bit of a corresponding level bit group of a hierarchical channel map.**

Nor does Christensen teach top level, second level and bottom level groups of a hierarchical channel map as recited in claim 29. As discussed above, Christensen only teaches a PND register having eight bits each corresponding to one of queues Q0-Q7.

In regard to independent claim 30, Christensen does not teach, for a first service time, examining a portion of one or more intermediate levels of the

hierarchical channel map to select a lowest level group of the communication channels in which at least one channel has a pending communication request, wherein each intermediate level indicates for each of a plurality of groups of the communication channels if at least one channel of that group has a pending communication request, wherein the groups at each intermediate level are sized smaller than at the previous intermediate level, and wherein examining a portion of each intermediate level determines which portion of the next hierarchical channel map level to examine. As discussed above, Christensen only teaches a PND register having eight bits each corresponding to one of queues Q0-Q7 for which entries are added or removed.

In regard to independent claim 31, Christensen does not teach a second memory configured to store a top level of a hierarchical channel map, wherein the plurality of communication channels are organized in channel sections, and wherein for each channel section said top level indicates if at least one of the communication channels within that section has a pending communication request. The PND register in Christensen indicates which queues have pending interrupt requests. However, this does not serve to organize the communication channels in Christensen into channel sections as recited in claim 31.

Further in regard to claim 31, Christensen does not teach a host adapter configured to determine a next channel to service by examining the lowest level in the first memory, wherein the host adapter determines the next channel to service by examining no more of the lowest level than a portion of the lowest level corresponding to one of the channel sections indicated by the top level as having at least one pending communication request. As discussed above, nothing in Christensen examines queues Q0-Q7 to determine a next channel to service. Christensen clearly does not teach examining no more of a lowest level of a hierarchical channel map than a portion of the lowest level corresponding to one of the channel sections indicated by the top level as having at least one pending communication request.

Applicant also asserts that numerous ones of the dependent claims recite further distinctions over the cited art. However, since the independent claims have been shown to be patentably distinct, a further discussion of the dependent claims is not necessary at this time.

Allowed Claims:

Claims 1-11 are allowed.

CONCLUSION

Applicant submits the application is in condition for allowance, and notice to that effect is respectfully requested.

If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5181-36000/RCK.

Also enclosed herewith are the following items:

- ☒ Return Receipt Postcard
- ☐ Petition for Extension of Time
- ☐ Notice of Change of Address
- ☐ Fee Authorization Form authorizing a deposit account debit in the amount of \$
for fees ().
- ☐ Other:

Respectfully submitted,



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